

HYDROLOGY

PRECIPITATION

The average annual precipitation is 40 inches, and average annual runoff is 12 inches.

GAGING STATIONS

Several United States Geological Survey (USGS) gaging stations have been operated throughout the basin (Figures 3A-D). Water quality monitoring has also been conducted by USGS at sites throughout the basin. The following list includes the gaging stations found in the basin with location and period of record listed (MDNR 1986; Castillon 1994; USGS 1987, 1989, 1994). Only numbers 2 (James River near Springfield), 4 (James River near Boaz), 5 (James River near Galena), and 7 (Wilson Creek near Brookline) are currently operating.

Gage sites:

- 1) James River at lat. 37 12'11", long. 93 04'47", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 24, T29N, R20W, at Greene County Highway YY bridge 4 miles south of Strafford and 1 mile downstream from Davis Creek. Period of record, 1973 to 1986.
- 2) James River at lat. 37 09'00", long. 93 12'12", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 2, T28N, R21W, at a Greene County bridge (Kinser Bridge) 2.5 miles southeast of Springfield and 1.1 miles downstream from Pearson Creek. Period of record, 1955 to current year. Prior to 1955, a non-recording gage was located at this site.
- 3) James River at lat. 37 04'35", long. 93 22'15", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 5, T27N, R22W, at Christian County road bridge (Nelson Mill Bridge) 2.5 miles southeast of Wilson Creek and 2 miles upstream from Wilson Creek. Period of record, August 1967 to September 1982; November 1983 to June 1987.
- 4) James River at lat. 37 00'25", long. 93 21'50", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 32, T27N, R22W, at Christian County road bridge (Frazier Bridge) 2 miles southeast of Boaz and 0.2 miles upstream of Turkey Hollow. Period of record, August 1967 to September 1982; November 1983 to June 1987; November 1992 to present.
- 5) James River at lat. 36 48'19", long. 93 27'41", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 6, T24N, R23W, in Stone County at State Highways 13 and 248 bridge in Galena, 0.7 miles from Railey Creek and 42.3 miles above mouth. Period of record, 1921 to current year. Prior to 1939, a non-recording gage was located at the site.
- 6) Wilson Creek at lat. 37 11'35", long. 93 20'20", in NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 28, T29N, R22W, 0.75 miles downstream from Jordan Creek and 2 miles southwest of Springfield. Period of record, 1932 to 1938.
- 7) Wilson Creek near Brookline at lat. 37 9'7", long. 93 22'18", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 7, T28N, R22W, in Greene County. Period of record, November 1993 to present year.
- 8) Wilson Creek near Battlefield at lat. 37 07'2", long. 93 24'14", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 24, T28N, R23W, in Greene County. Period of record, 1972 to 1982.

9) [Wilson Creek](#) near Springfield at lat. 37 10'6", long. 93 22'14", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 6, T28N, R22W, in Greene County. Period of record, 1972 to 1982.

10) Wilson Creek below Springfield at lat. 37 09'2", long. 93 22'12", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 7, T28N, R22W, in Greene County. Period of record, 1967 to 1970; 1970 to 1972.

11) Tributary to James River at lat. 37 04'20", long. 93 13'05", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 3, T27N, R21W, in Christian County on the left bank just upstream from a culvert under the old state Highway 65 bridge, 3.4 miles north of Ozark. Period of record, 1957 to 1965.

12) James River at lat. 37 05'30", long. 93 21'25", in NE $\frac{1}{4}$ Sec. 32, T28N, R22W, in Greene County at Blue Spring highway bridge, 1.6 miles southwest of Battlefield and 3 miles upstream from Wilson Creek. Period of record, 1926 to 1932.

13) Finley Creek at Sec. 9, T27N, R20W, in Christian County at Highway 125, Lindenlure Dam. Period of record, 1969 to 1970; 1972.

14) Finley Creek at Sec. 23, T27N, R21W, in Christian County, Ozark Dam. Period of record, 1946 to 1967; 1952; 1962 to 1967.

Water Quality Stations:

15) James River near Nixa at lat. 37 06'13", long. 93 15'49", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 30, T28N, R21W, in Greene County. Period of record, 1962 to 1963; 1965 to 1967.

16) James River near Wilson Creek at lat. 37 04'35", long. 93 22'15", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 5, T27N, R22W, in Christian County. Period of record, 1967 to 1982; 1983 to 1987.

17) Wilson Creek near Battlefield at lat. 37 07'2", long. 93 24'14", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 24, T28N, R23W, in Greene County. Period of record, 1972 to 1982.

18) Wilson Creek near Springfield at lat. 37 10'6", long. 93 22'14", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 6, T28N, R22W, in Greene County. Period of record, 1972 to 1982.

19) Wilson Creek below Springfield at lat. 37 09'2", long. 93 22'12", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 7, T28N, R22W, in Greene County. Period of record, 1967 to 1970; 1970 to 1972.

20) Finley Creek at Riverdale at lat. 36 59'10", long. 93 17'40", in Christian County. Period of record, 1967 to 1975.

STREAM FLOW

The peak discharges for gages located on the James River at Springfield and Galena occur in May (USGS 1993). The annual mean discharge for the Springfield gage is 237 cfs. The highest annual mean (465 cfs) occurred in 1985, and the lowest (52.8 cfs) was recorded in 1956 (USGS 1993). The annual mean discharge at the Galena gage is 981 cfs. The highest annual mean (2,499 cfs) occurred in 1927, and the lowest occurred in 1954 with a value of 119 cfs (USGS 1993).

The 7-day Q2 and Q10 values describe the low flow conditions and reflect the relative permanence of streams throughout the basin. The 7-day Q2 and Q10 values for various locations are listed in [Table 4](#).

Table 4. Seven-day low flow discharges (cfs) in the James River Basin with recurrence intervals of two years (Q2) and ten years (Q10).

STREAM	LOCATION	PERIOD OF RECORD	7-DAY Q2	7-DAY Q10
Crane Creek	Galena	1968-1972	24.0	
Finley Creek	Linden	1969-1972	7.6	5.2
Finley Creek	Ozark	1943-1967	16.0	5.2
Flat Creek	Cassville	1944-1967	4.0	1.4
Flat Creek	Cape Fair	1969-1974	32.0	11.0
Flat Creek	Jenkins	1942-1967	27.0	10.0
James River	Galena	1921-1993	100.0	38.0
James River	Northview	1968-1972	1.5	
James River	Near Springfield	1955-1993	11.0	1.0
Sequoiota Spring	Springfield	1936-1972	1.2	

Source: Missouri Department of Natural Resources (1995a), and Castillon (1994).

PERMANENT/INTERMITTENT STREAMS

There are several streams in the basin which have intermittent status for all or portions of their length. The total mileage for intermittent streams with permanent pools is 74 miles. The length of streams with permanent flow in the basin is 289 miles (Funk 1968). Mileages for intermittent streams with permanent pools are included in [Table 5](#). Losing stream reaches are listed in [Table 6](#) and shown in Figures 4A-D.

DAMS AND HYDROPOWER INFLUENCES

Lake Springfield is the only large dam on the James River (Figure 1). It creates Lake Springfield (318 acres), a cooling water supply lake for a Springfield City Utilities coal-fired power plant. Table Rock Dam, on the White River near Branson, has also impounded a portion of the James River below Galena. These dams have altered flows of the James and White river systems. The influences of these dams include water temperature changes and limitations on fish migration.

There are also several smaller, privately owned, low dams in the basin which were used in the past for power production or to run grain mills. These dams include: Lindenlure Dam on Finley Creek at Missouri Highway 125, Ozark Dam on Finley Creek at Ozark, Riverdale Dam one mile east of Missouri Highway 160 on Finley Creek, Hurley Dam on Spring Creek in Hurley, Calton Mill Dam on Little Flat Creek east of Purdy, and McDowell Mill Dam on Flat Creek east of Purdy (Castillon 1994 and Castillon unpublished).

Table 5. Intermittent streams with permanent pools in the James River Basin.

STREAM NAME	COUNTY	TOTAL MILES INTERMITTENT POOLS
Dry Creek	Barry-Stone	5.0
Fortune Branch	Barry	2.0
Galena Hollow	Barry	3.0
Gunter Creek	Barry	6.0
Jenkins Creek	Barry	2.5
Lateral to Flat Creek	Barry	2.0
Lateral to Little Flat Cr	Barry	5.0
Lateral to Little Flat Cr	Barry	3.5
Lateral to Rock House Creek	Barry	1.0
Lateral to Rock House Creek	Barry	2.5
Lateral to Rock House Creek	Barry	2.5
Little Crane Creek	Barry-Stone	4.5
Little Flat Creek	Barry	1.0
Roark Hollow	Barry	0.5
Rock House Creek	Barry	5.0
Sugar Camp Hollow	Barry	2.0
Willow Branch	Barry	3.0
Lateral to Finley Creek	Christian	0.5
Lateral to Finley Creek	Christian	1.0
Stewart Creek	Christian	1.0
Terrell Creek	Christian	1.0
Lateral to James River	Greene	0.5
Lateral to James River	Greene	0.5
Lateral to James River	Greene	2.0
Lateral to James River	Stone	4.5
Lateral to Pearson Creek	Greene	0.5
Horse Creek	Stone	1.5
Railey Creek	Stone	6.5
Silver Lake Branch	Stone	1.0
Wilson Run	Stone	2.0

Source: Funk (1968).

Table 6. Losing stream reaches in the James River Basin.

STREAM NAME	FIRST COUNTY	SECOND COUNTY	LENGTH (mi)	LEGAL START (T R S)	LEGAL END (T R S)
Flat Creek	Barry	Barry	3.0	NW,NE,NW 22N 28W 23	SE,SE,NW 22N 27W 6
Little Flat Creek	Barry	Barry	2.0	NW,NW,NW 25N 27W 35	SE,SE,NE 25N 27W 36
Little Flat Creek	Barry	Barry	3.0	SE,NE,SE 24N 28W 11	NE,NE,NE 25N 27W 33
Unnamed Trib to Flat Creek	Barry	Barry	1.5	NW,NE,SE 22N 27W 9	SE,SE,NE 22N 27W 5
Unnamed Trib to Flat Creek	Barry	Barry	1.0	NW,NW,SE 23N 27W 22	NE,SW,SE 23N 27W 21
Big Hollow	Christian	Christian	1.5	NE,NW,NW 28N 20W 36	SW,SE,SE 28N 20W 35
Carter Hollow	Christian	Christian	2.0	SE,NE,SW 27N 20W 26	NE,NE,NW 27N 20W 22
Dry Crane Creek	Christian	Christian	1.0	NE,SW,NE 27N 23W 32	Co. Line 27N 23W 33
Elk Valley	Christian	Christian	9.0	NW,SW,NE 27N 20W 32	NW,NW,NE 27N 21W 31
Finley Creek	Christian	Christian	2.5	NW,NW,SE 27N 19W 18	SW,NE,NW 27N 20W 14
Finley Creek	Christian	Christian	1.0	SE,NW,SW 27N 20W 18	SE,SW,NW 27N 21W 13
Green Valley Creek	Christian	Christian	5.0	NW,SW,SE 27N 23W 28	NE,SW,SW 27N 23W 12
Hog Creek	Christian	Christian	0.1	SE,SE,NW 26N 22W 1	NE,SE,NW 26N 22W 1
Hog Creek	Christian	Christian	5.5	NE,NW,NW 26N 21W 23	SE,NW,SW 26N 21W 6
Johnson Hollow	Christian	Christian	2.2	NW,NW,NW 27N 19W 29	NE,SW,SW 27N 20W 13
McCafferty Hollow	Christian	Christian	3.0	NE,SE,NW 27N 22W 26	NW,SW,SW 27N 22W 33
Saunders Valley	Christian	Christian	1.5	NE,NW,NE 27N 22W 9	SW,SW,NW 28N 22W 33
Spout Spring Hollow	Christian	Christian	1.2	SW,SW,SE 27N 21W 18	NE,NW,NW 27N 21W 29
Spring Creek	Christian	Christian	0.7	SW,NW,SE 27N 24W 14	NW,NE,NE 27N 24W 26
Spring Creek	Christian	Christian	1.7	NE,SE,NE 27N 24W 26	Co. Line 27N 24W 36
Terrell Creek	Christian	Christian	8.0	NE,NW,SW 27N 24W 15	NW,NW,NW 27N 23W 2
Tory Creek	Christian	Stone	4.8	SW,SE,SE 26N 22W 36	NW,SE,NE 26N 22W 20
Unnamed Trib to Big Hollow	Christian	Christian	1.5	NW,NE,SW 28N 20W 35	NW,NE,SE 27N 20W 2
Unnamed Trib to Carter Hollow	Christian	Christian	1.0	NE,SE,NE 27N 20W 28	NE,SW,SE 27N 20W 22
Unnamed Trib to Carter Hollow	Christian	Christian	1.0	NE,SE,NW 27N 20W 26	SE,NW,SE 27N 20W 22
Unnamed Trib to Elk Valley	Christian	Christian	2.5	NW,SE,NW 26N 20W 7	NE,NW,NE 26N 21W 2
Unnamed Trib to Elk Valley	Christian	Christian	0.5	SE,NE,SW 26N 21W 2	NE,SE,NE 26N 21W 3
Unnamed Trib to Elk Valley	Christian	Christian	2.5	SE,NE,SE 26N 21W 13	SE,SE,SE 26N 21W 3

Unnamed Trib to Elk Valley	Christian	Christian	1.5	SE,NE,SE 26N 21W 10	SE,SW,NE 26N 21W 3
Unnamed Trib to Finley Creek	Christian	Christian	1.7	NE,NE,SE 27N 22W 26	SE,NW,NE 26N 22W 2
Unnamed Trib to Finley Creek	Christian	Christian	1.0	SE,SE,SW 27N 21W 26	NW,NW,NW 27N 21W 26
Unnamed Trib to Finley Creek	Christian	Christian	1.0	SE,SW,NW 27N 21W 21	NE,SW,NE 27N 21W 28
Unnamed Trib to Finley Creek	Christian	Christian	2.5	NW,NW,SW 27N 22W 13	NE,SE,NW 27N 21W 30
Unnamed Trib to Finley Creek	Christian	Christian	2.0	SW,SE,SW 27N 19W 4	NE,NE,SW 27N 19W 17
Unnamed Trib to Finley Creek	Christian	Christian	2.0	SE,NE,SE 27N 19W 4	NE,NW,SE 27N 19W 16
Unnamed Trib to Finley Creek	Christian	Christian	3.0	NW,NE,NW 28N 20W 31	SE,SE,SW 27N 20W 7
Unnamed Trib to Finley Creek	Christian	Christian	2.0	NW,NE,NE 28N 20W 32	NW,SE,SE 27N 20W 5
Unnamed Trib to Finley Creek	Christian	Christian	3.5	NW,NE,NW 28N 20W 34	NE,NE,SE 27N 20W 7
Unnamed Trib to Finley Creek	Christian	Christian	2.0	NE,NE,SE 28N 20W 34	NW,SE,NW 27N 20W 4
Unnamed Trib to Finley Creek	Christian	Christian	1.5	SE,NE,SW 27N 20W 20	SW,SW,NE 27N 20W 17
Unnamed Trib to Finley Creek	Christian	Christian	1.5	NW,SE,SW 27N 20W 21	SE,SE,NE 27N 20W 17
Unnamed Trib to Finley Creek	Christian	Christian	1.8	NW,NE,SE 27N 22W 26	SE,NW,NE 26N 22W 2
Unnamed Trib to Finley Creek	Christian	Christian	2.5	NW,NW,SE 27N 21W 9	SE,SE,SE 27N 21W 20
Unnamed Trib to Finley Creek	Christian	Christian	1.5	SE,NW,SE 27N 21W 9	NE,NE,NE 27N 21W 20
Unnamed Trib to Finley Creek	Christian	Christian	2.2	NE,NE,NE 27N 21W 16	SW,NE,NE 27N 21W 28
Unnamed Trib to Finley Creek	Christian	Christian	1.0	NW,NE,SW 27N 21W 1	NW,NW,NW 27N 21W 12
Unnamed Trib to Finley Creek	Christian	Christian	0.8	SE,SW,NE 27N 21W 1	NW,NW,NE 27N 21W 12
Unnamed Trib to Finley Creek	Christian	Christian	0.5	SW,SE,SE 27N 21W 24	NW,NE,NW 27N 21W 25
Unnamed Trib to Finley Creek	Christian	Christian	0.7	SE,NE,SE 27N 21W 23	NE,SE,NW 27N 21W 23
Unnamed Trib to Finley Creek	Christian	Christian	0.3	SW,SE,NE 27N 20W 30	SW,NW,SE 27N 21W 14

Table 6 continued.

STREAM NAME	FIRST COUNTY	SECOND COUNTY	LENGTH (mi)	LEGAL START (T R S)	LEGAL END (T R S)
Unnamed Trib to Terrell Creek	Christian	Christian	0.4	SW,SE,NW 27N 24W 14	SW,NW,NW 27N 24W 14
Unnamed Trib to Terrell Creek	Christian	Christian	1.2	SW,SE,SE 27N 24W 11	SW,SW,SW 27N 24W 1
Unnamed Trib to Terrell Creek	Christian	Christian	0.8	SE,NE,NE 27N 24W 2	NW,NW,SE 27N 24W 1
Unnamed Trib to Terrell Creek	Christian	Christian	1.5	NE,NE,SE 28N 24W 36	SE,SW,NW 27N 23W 5
Unnamed Trib to Terrell Creek	Christian	Christian	0.8	CENTER 27N 23W 9	NE,NW,SE 27N 23W 4
Unnamed Trib to Terrell Creek	Christian	Christian	1.0	NW,NW,SW 27N 23W 17	NE,NW,NW 27N 23W 16
Unnamed Trib to Terrell Creek	Christian	Christian	0.2	NW,SW,NW 27N 23W 16	NE,NW,NW 27N 23W 16
Unnamed Trib to Terrell Creek	Christian	Christian	1.0	SE,SW,SW 27N 23W 16	NE,NW,NW 27N 23W 16
Unnamed Trib to Tory Creek	Christian	Christian	1.5	NW,SW,NE 26N 22W 23	SW,SE,SW 26N 22W 22
Unnamed Trib to Tory Creek	Christian	Christian	1.5	SW,NW,SE 26N 22W 23	NW,NE,NW 26N 22W 27
Unnamed Trib to Tory Creek	Christian	Christian	2.0	NE,NW,SW 26N 22W 24	NW,SE,SE 26N 22W 27
Unnamed Trib to Tory Creek	Christian	Christian	1.0	NE,NE,SW 26N 22W 25	SE,SW,NE 26N 22W 26
Unnamed Trib to Tory Creek	Christian	Christian	3.0	NE,SW,NW 25N 22W 12	NW,SW,SW 26N 22W 26
Unnamed Trib to Tory Creek	Christian	Christian	1.0	NW,SE,NE 25N 22W 3	SE,SW,NW 26N 22W 35
Unnamed Trib to Tory Creek	Christian	Christian	1.0	SE,NW,NW 25N 22W 11	SE,NW,NE 25N 22W 2
Unnamed Trib to sinkhole	Christian	Christian	0.7	NE,SE,SW 27N 22W 2	SE,SE,NE 27N 22W 11
Unnamed Trib to sinkhole	Christian	Christian	1.2	SW,NE,NW 27N 22W 11	NE,SE,NW 27N 22W 14
Broad Creek	Greene	Greene	2.0	SE,NE,SW 29N 20W 3	NE,SE,NW 29N 20W 15
James River	Greene	Greene	0.5	SW,NW,SE 28N 21W 30	SW,SW,SW 28N 21W 30
Pearson Creek	Greene	Greene	1.0	SW,SE,NW 29N 21W 26	SE,SW,NE 29N 21W 35
Shulyer Creek	Greene	Greene	2.5	SW,NE,NW 28N 23W 28	NW,SE,SW 28N 23W 26
Turner Creek	Greene	Greene	1.5	NE,SW,NW 28N 20W 3	NE,SW,NW 29N 20W 33
Unnamed Trib to James River	Greene	Greene	1.2	NE,NE,SW 28N 22W 20	NE,NW,SE 28N 22W 29
Unnamed Trib to James River	Greene	Greene	1.0	NE,SE,NW 29N 20W 12	SE,NW,NE 29N 20W 13
Unnamed Trib to James River	Greene	Greene	5.5	NE,NE,SE 28N 21W 24	SW,NW,SE 28N 21W 30
Unnamed Trib to Pearson Creek	Greene	Greene	1.0	NW,SW,NE 29N 21W 34	NE,SW,NE 29N 21W 35
Unnamed Trib to Ward Branch	Greene	Greene	1.0	NE,SW,NE 28N 22W 21	SE,NW,NW 28N 22W 27

Unnamed Trib to Wilson Creek	Greene	Greene	3.0	SW,SE,SE 28N 22W 3	SE,NE,NE 28N 22W 7
Unnamed Trib to Wilson Creek	Greene	Greene	1.0	SW,NE,NE 29N 22W 20	NW,NW,NW 29N 22W 28
Ward Branch	Greene	Greene	2.5	NE,SE,SE 28N 22W 14	SE,NW,NW 28N 22W 27
Wilson Creek	Greene	Greene	4.3	NE,NW,NE 29N 22W 29	NW,SW,SE 28N 22W 7
Unnamed Trib to Wilson Run	Stone	Stone	0.9	NW,SW,SE 24N 23W 35	NW,SW,SW 24N 23W 25
Unnamed Trib to Wilson Run	Stone	Stone	1.7	SW,SW,SW 24N 23W 35	SW,SE,NE 24N 23W 26
Burks Hollow	Webster	Webster	2.8	SE,SE,SE 29N 19W 36	SW,NW,SW 29N 19W 23
Davis Branch	Webster	Webster	3.7	SW,SW,SW 29N 18W 36	SW,NE,NE 28N 18W 11
Davis Branch	Webster	Webster	0.4	NE,SW,SE 28N 18W 21	SW,SE,NE 28N 18W 21
Peck Hollow	Webster	Christian	2.3	SW,SW,NW 28N 19W 21	SE,NW,SW 28N 19W 32
Pedelo Creek	Webster	Christian	5.3	NE,NW,SW 28N 19W 22	NE,NW,SE 27N 19W 6
Sawyer Creek	Webster	Webster	1.7	NE,NW,SW 28N 19W 17	NE,SW,NW 28N 19W 7
Terrel Branch	Webster	Webster	2.0	NE,SW,NE 28N 18W 8	NW,SW,NE 28N 18W 20
Unnamed Trib to Finley Creek	Webster	Webster	3.1	NE,NE,SE 28N 17W 2	CENTER 28N 17W 23
Unnamed Trib to James River	Webster	Webster	3.4	NW,SW,SW 29N 19W 30	SW,NE,SW 29N 19W 17
Unnamed Trib to James River	Webster	Webster	3.1	SE,NW,SW 29N 18W 25	SE,SE,SW 29N 17W 7
Unnamed Trib to Sawyer Creek	Webster	Webster	0.5	NW,NW,SW 28N 19W 17	NE,NW,NE 28N 19W 18
White Oak Creek	Webster	Webster	1.7	NW,NW,NW 28N 19W 16	NE,NW,NE 28N 19W 18

Source: Duchrow (1991).